OXYGEN SENSORS

+ 20 years of experience manufacturing ceramic sensors

References

+850

Applications

+25K

VIO

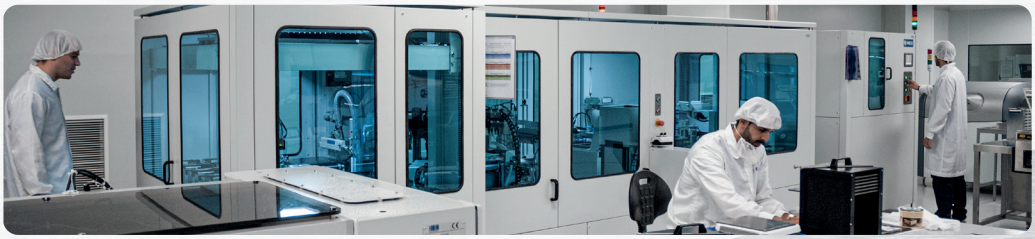
+525M

Leading product

• O_2 sensors are an essential component of any vehicle which, because of its operation, emits all sort of gases. It's currently used for internal combustion vehicles to reduce harmful particulate emissions. It's going to be incorporated in hydrogen-powered electric vehicles as it produces a chemical reaction that expels oxygen and water.

• It continuously detects the residual oxygen value in the exhaust gases, allowing the Control Unit (ECU) to adjust the air-fuel mixture at injection to the optimum value. In this way, the lambda sensors regulate the air/fuel ratio to improve efficiency and reduce all the vehicle's pollution.

• FAE with its Planar Multilayer Ceramic technology has achieved the goal of integrating in one solid the element of the sensor and its calefactory and reducing its size compared to conventional lambda probes. These improvements allow us to reduce the heating power and the time needed to reach the operating temperature (700º Celsius).



Technology	Titania binary	Zirconia binary				Wide Band		
Sensing material	Titanium Dioxide (TiO_2)	Zirconium Dioxide (ZrO_2)				Zirconium Dioxide (ZrO_2)		
Working principle	Resistive	Electrochemical				Electrochemical		
Output signal	Voltage	Voltage				Current		
Thread	M12 / M18	M18		M12		M18		
Size	Standard	Standard		Mini		Standard		
Air reference	No	Yes		Yes	No	Yes	No	Yes
Number of wires	3-4	1-2	3-4	1-4		5		4 AFR
Heating element	Yes	No	Yes	Yes		Yes	Yes	Yes

FAE	⊕	⊕	⊕	⊕	⊕	⊕	⊕
1st competitor	⊖	⊕	⊖	⊕	⊕	⊕	⊖
2nd competitor	⊕	⊕	⊕	⊕	⊖	⊕	⊖

Oxygen Sensor **Titania**

Oxygen Sensor **Zirconia**
Planar Technology

Mini

Oxygen Sensor **Wide Band**

Air Fuel Ratio

NEW

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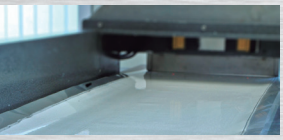
Ceramic sensor according to the client's needs

Formulation, characterisation and creation of conductive inks and ceramic materials by the R&D&i department at the **FAE** laboratory, producing a ceramic spool that is processed in layers and achieving inks of different compositions.



How? Tape casting machine, 50 to 800 micrometers, for tapes up to 20 inches wide. Automatic whitening machine for the creation of substrates.

Punching in order to create a connection between different layers and channels, plus laser marking for traceability.

How? Automatic punching machine.

Filling the pathways and circuits to achieve a multi-layer connection via the conductive ink.

How? Printing system for rigid substrates of up to 8 x 8 inches, assisted by computer vision.
Printing system for rigid substrates of up to 2 x 2 inches.

Stacking, laminating and compressing the different layers that comprise the sensor element.

How? Substrate stacking machine. Isostatic laminator.

Cutting and baking the final set in order to obtain the ceramic sensor element.

How? Substrate stacking machine. Isostatic laminator.

Assembling the lambda sensor in accordance with the client's needs.

How? Automated assembly of the sensor array, followed by laser soldering of the cable array.
Laser equipment for trimming and cutting the substrates. Manual pick & place equipment and reflow oven for mounting electronic components onto ceramic substrates, PCBs and flexible substrates.

Cable
Fluoropolymer cable coating with high performance for extreme temperatures.

Joint
Degree of protection water resistance IP68, capable of functioning in continuous water immersion.

Protective tube

Ceramic clamp
Own manufacturing. Connect the cables with the sensor and prevent them from disconnecting.

Ceramic insulators
It ensures tightness and prevents contamination that cements the sensor and isolates it from vibrations and shocks.

Sensor
Multilayer ceramic planar technology. Formulation of inks and ceramics. Individualized calibration. Integrated heater for ultra-fast ignition.

Benefits when replacing

- Extend the life of the catalyst
- Reduce fuel consumption
- Reduce pollution

Malfunction symptoms

- Excessive fuel consumption
- High emissions of pollutants
- Check Engine warning light comes on

Causes of failure

- Excess lead in gas emissions
- Antifreeze contamination in exhaust gases
- Excessively rich air-fuel mixture
- High oil consumption
- Silicon contamination in the motor

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